

REMARKS

Claim rejections under 35 U.S.C. 103(a) as being unpatentable over EP '744 taken with JP '153

Claims 1-20 have been rejected under 35 U.S.C. 103(a) as being unpatentable over EP 1 216 744 A1 ("EP '744") taken with Japanese Application 10249153 ("JP '153"). Applicants respectfully traverse the rejections. Reconsideration and withdrawal of the rejections are respectfully requested in view of the amendments and remarks.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). *See* MPEP §2142.

EP '744 column 1, lines 5-6, discloses that the present invention relates to the recovery of carbon dioxide from gaseous streams containing it. EP '744 column 5, lines 52-56, discloses that CO₂ recovered from flue gas or other feed streams using the above process can be directly used as vapor for onsite applications. Several CO₂ applications such as pH control of wastewater can use CO₂ vapor directly from the absorption process.

Applicants suggest that there is no suggestion or motivation to modify EP '744 to contact the carbon dioxide stream with silicate particles dispersed in an aqueous solution in a mineral carbonation zone said silicate particles being a bivalent alkaline earth metal silicate as described, for example, in Applicants' independent claims 1 and 19. Applicants suggest that the Office Action is using improper hindsight based on Applicant's invention to modify EP '744 to contact the carbon dioxide recovered in the EP '744 process with silicate particles.

Applicants also suggest that the heating in the EP '744 process is generally provided by heat exchanger 10 and reboiler 21. EP '744 column 4, lines 16-22, discloses that the CO₂-rich stream in line 9 is then heated in a countercurrent heat exchanger 10 by the hot regenerated or lean absorbent stream 29 to a temperature of 100 - 110°C and is subsequently fed via line 11 to the top of the stripper 12. Alternatively, this stream can be heated before it is compressed in pump 8. EP '744 column 5, lines 17-23, discloses that the solvent 20 from the bottom of the stripper 12 is heated indirectly in the reboiler 21, which typically operates at a temperature of around 119 - 135°C. Saturated steam 48 at a pressure of 30 psig or higher can provide the necessary heating. The heated solvent vapor 22, which is primarily steam, is recirculated to the stripper. EP '744 column 5, lines 24-26, discloses that the stripped carbon dioxide-lean absorbent solution 23 from the reboiler is pumped back by the lean solvent pump 35 to the heat exchanger 10.

Applicants suggest that there is no suggestion or motivation to modify EP '744 and the heating described in EP '744 to contact the carbon dioxide stream with silicate particles and to utilize the heat released in the contacting of the carbon dioxide stream with silicate particles to provide heat for heating the carbon dioxide-containing solvent as described, for example, in Applicants' dependent claims 2 and 3 and independent claim 19.

The Office Action at page 2, concerning claim 2, indicates that using heat exchange is an obvious expedient to optimize economic efficiency by reducing heating costs. Applicants respectfully traverse the Office Action statement and suggest that such statement is based on improper hindsight based on Applicants' claimed invention.

Applicants also suggest that there is no motivation or suggestion to modify EP '744 to route the product CO₂ stream, for example, EP '744 product CO₂ stream 16, to a contacting with silicate particles to release heat and then using the heat released to provide heating of the CO₂-enriched liquid absorbent stream, for example, EP '744 CO₂-enriched liquid absorbent stream 7. Applicants also suggest that the EP '744 emphasis of utilizing a heat exchanger and a reboiler prevents one skilled in the art from having a reasonable expectation of success of modifying EP '744 in such a manner.

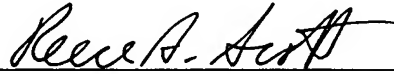
Applicants also suggest that EP '744, alone or in combination with JP '153, does not teach or suggest all the claimed features of Applicants' claims, for example, that the heat released in step (c) is used in step (b) (Applicants' dependent claim 2) or, for example, that at least 50% of the heat needed for step (b) is supplied by the heat released in step (c) (Applicants' dependent claim 3), or, for example, regarding step (b), that at least 50% of the heat needed is supplied by the heat released in step (c) (Applicants' independent claim 19).

CONCLUSION

Applicants respectfully request reconsideration and withdrawal of the claim rejections under 35 U.S.C. 103(a). Applicants further respectfully request entry and consideration of the above remarks to advance the above-identified application to allowance.

Respectfully submitted,

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